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ABSTRACT

This handbook focuses on the use of 35mm slides for audiovisual presentations, particularly as an alternative to the more expensive and harder to produce medium of video. Its point of reference is creating slide shows about experiences in the Peace Corps; however, recommendations offered about both basic production procedures and enhancements are transferable to almost any subject area. The guide progresses from fundamental to more advanced topics, including the following: (1) choosing a scripted versus a "talk-as-you-go" format; (2) determining the focus of the show in the initial planning process; (3) writing scripts and cue cards; (4) dealing with difficult topics--e.g., avoiding cliches and stereotypes in photographs and music; (5) using music thoughtfully--e.g., juxtaposing music with narration; (6) recording a simple soundtrack; (7) editing slides; (8) arranging the logistical details of your presentation--e.g., arrangements to be made beforehand, equipment needed, tools to carry, preparing an audience; (9) selecting audiovisual equipment to purchase, rent, or borrow; (10) coping with equipment malfunctions; (11) having slides made from non-slide materials; (12) making title slides; and (13) developing a one-projector programmed show. Photography suggestions, books for further reference, and detailed technical notes are also included. (SD)

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AUDIOVISUAL TECHNIQUES

by
Darrel Hess

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National Council of Returned Peace Corps Volunteers
Development Education Program

AUDIOVISUAL TECHNIQUES HANDBOOK

by

Darrel Hess

Peace Corps Volunteer
Korea, 1978-80

"If a picture is worth a thousand words, why are you talking so much?"

--Kurt Plunk, Audiovisual Producer

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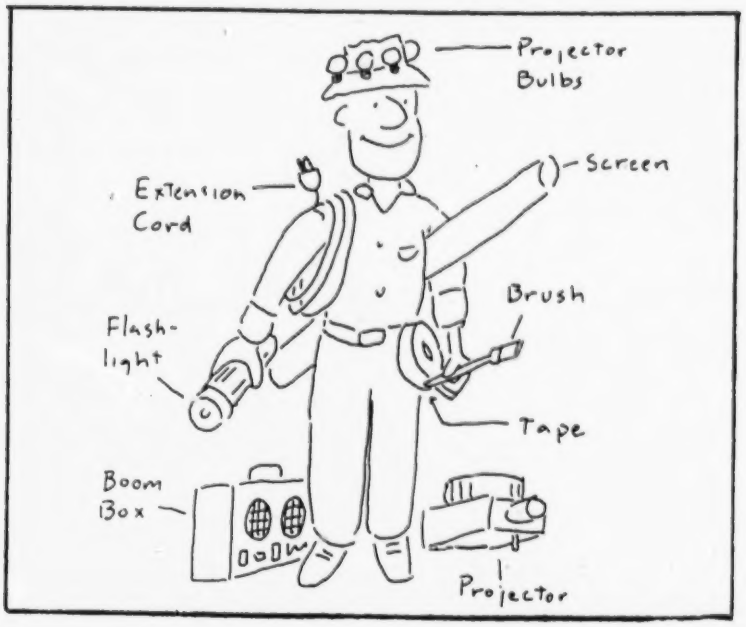
Section 1. Why Bother?

Well-prepared audiovisual presentations help you get your message across. A polished show puts you at ease in front of an audience, and this reflects on you as a professional and knowledgeable speaker. And besides, it's fun.

People today expect to see high-quality presentations. They've seen so many flashy movies and television shows that many people find it hard to sit patiently through an "old-fashioned" slide show. But by adding music and a well-written narration, slide shows can be dramatic and artistic. And unlike video, slide shows are inexpensive to produce, easy to edit and update, and are ideally suited for presenting to large audiences.

This handbook focuses on the use of 35mm slides. It progresses through a variety of subjects including suggestions on planning slide shows, writing presentation outlines and scripts, editing slides, and choosing music. It also presents advanced topics such as recording soundtracks, preparing title slides, and an introduction to producing automatic one-projector slide/tape shows.

Included as an appendix is a collection of Tech Notes. These are supplemental sections on various technical aspects of audiovisual work. They are referred to throughout the handbook.



Section 2. Presentation Options

There are many ways to use slides, music, and narration in educational slide shows. The combination you choose depends on the equipment you have, as well as the time you are willing to dedicate to a production.

"Scripted" Shows Vs. "I'll-Just-Talk-About-My-Slides-As-I-Go-Along" Shows

Many people like the spontaneity of a show in which they present their slides and talk about each as they go along. The vacation slides your friends invite you over to see are usually presented like this.

The advantage of this kind of presentation is that it usually is more relaxed and flexible than a scripted show. The show is rarely the same, making it interesting for the presenter to give over and over again. Also, it doesn't require as much time or planning to put together.

As for disadvantages . . . you've all sat through rambling marathons of slides. The presenters seem to have an endless story about each slide, or can't quite remember the name of city they're showing, or tell us what we would be seeing in a slide if it wasn't quite so underexposed . . .

"Talk-as-you-go" shows don't have to be bad, but they often are. Try recording yourself as you give one of these shows. You'll find out just how much you forgot to say -- or how often you said too much.

"Scripted" shows are written out word-for-word so the content is always the same. Shows with pre-recorded soundtracks obviously have to be scripted, but some people will give a show by reading the script as they go along.

The problem with scripted shows is that it is difficult to make one sound natural when given live. If you are recording a scripted show, however, you have the luxury of going back and re-recording it until it sounds right.

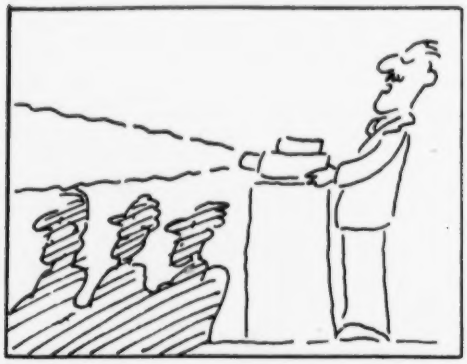
A good compromise between a talk-as-you-go show and a completely scripted show is the "Cue Card" show. Instead of writing down your thoughts word for word, you mark down the important ideas on 3 x 5 cards, one for each slide. You maintain your spontaneity while being sure you're covering the material.

"Live" Vs. "Programmed" Shows

The decision about whether to do a live or programmed show usually depends on what equipment you have available. A "programmed" show is one that has a pre-recorded soundtrack that is played on a special tape recorder which automatically advances the slides. A "cue" track, not heard by the audience, sends signals to the projector. These shows are produced on an "audiovisual" tape recorder or with the Kodak EC Sound-Slide Synchronizer (see section 11, "Common AV Equipment").

Programmed shows may also use two or more slide projectors. These are commonly called dissolve shows and require the use of an electronic dissolve unit to synchronize the projectors. In a dissolve show, each slide fades into the next, resulting in a smooth and flowing presentation. For more information on two-projector shows, see the books recommended in Section 17.

Most people start out producing slide shows without access to equipment for programmed shows and produce "live" shows manually advancing each slide in the show. These shows, like programmed shows, can have a pre-recorded soundtrack with music and narration and can look exactly the same as a programmed show. The only difference is that you must advance the slides manually each time you present the show, rather than having the machines do it.



Types of Shows

Here is a summary of the most common types of slide shows:

- Talking as you manually advance each slide.
- Reading a script or cue cards as you manually advance each slide.
- Playing a recorded soundtrack of music and/or narration on a tape recorder while you manually advance each slide.
- Playing a soundtrack on an "audiovisual" tape recorder which automatically advances each slide along with the tape.

My recommendation is for you to consider scripting and recording a simple soundtrack to play back as you show your slides. A recorded soundtrack adds the touch of professionalism that makes audiences pay more attention to a presentation than they do to a talk-as-you-go show.

You can also use a soundtrack for one section of your presentation, then finish with a live, personally narrated section.

Section 3. Getting Started

At this point you make decisions about the message of your show and how best to use slides to reinforce that message. This is the hard part.

- Decide on the focus of your show. If you are presenting information about a country, you might do it from a historical perspective, through the eyes of a child growing up, or from your experiences as a foreigner living there.
- Write down the ten or so most important things you want your audience to learn from the presentation. For example, when talking about a country, religion might have played a key role in shaping the society, or perhaps a history of foreign invasions has left scars that influence the country today.
- Using 3 x 5 cards is a handy way to outline a show. The cards with your most important ideas become the framework for your script or cue cards later on.
- Presenting facts in a show is easy; communicating concepts is tough. Think of examples to illustrate your ideas.
- Review all of your slides. At this stage, you are just familiarizing yourself with what you have -- especially if it's been a few years since you looked at them. Get a sense of what topics you can easily illustrate, and what topics will require a bit more imagination. Later, as you begin to write your script, keep in mind the general selection of images you have available.
- Consider using slides of maps or artwork in your show. Creating new slides for your presentation can fill in gaps in your slide collection and add a finished touch to your show.
- Don't skip this initial planning process. Shows rarely just fall into place. The better you plan a show from the beginning, the easier it is to produce -- and the less time you will waste in the long run.

Length

Consider the length of your show. Probably the most common complaint an audience has is that a slide show is too long. It doesn't matter how beautiful your slides are, or how important your topic. When it's too long, you lose the audience. The old show business adage, "keep them asking for more," certainly applies here.

- For shows with pre-recorded soundtracks, generally 10 to 15 minutes is an ideal length. This sounds short, but you can cover a remarkable amount of information in this time.

- For "cue card" or "talk-as-you-go" shows, 25 minutes is about the maximum. You will often be given a fairly short amount of time to present your show. By the time you introduce the show and allow for questions and discussion afterward, an hour can go by very quickly. Ten- to 15-minute shows are much easier to fit into a teacher's or community group's tight schedule. The shorter your show, the more opportunities you'll have to use it.

- If you have so much information that you simply can't put it into one show, then make a second show. If you have enough time, you can present both. You can return another time for the second.

  Consider a trilogy: an 11-minute narrated show, followed by two shorter shows of about four minutes each with just music and slides. The combination lasts about 20 minutes, but it can be shortened by leaving out one of the shows. Audiences seem to like the pauses and changes of pace, and the impact of this combination probably couldn't be achieved in a single show.

Section 4. Script and Cue-Card Writing

For most people, this seems to be the least enjoyable part of the job. If you have carefully outlined the content of your show, the hardest part is really over. These suggestions apply if you are writing a narration to be recorded, or just writing down ideas for your cue cards.

- Use 3 x 5 cards at first. Begin with your major topics, then fill in the details with additional cards. At this stage, each card might just have a sentence or two.
- Work on the floor, laying the cards out in order. As you shuffle the show around, the gaps and weak sections become obvious. As the content comes together, begin writing full sentences.
- Begin at the beginning. Give your audience the basics of your region or topic. Describe the geography, economy, history -- any background information the audience should know.
- For scripted shows you will record, use fairly short sentences and simple syntax. Write to be heard, not read. Practice your script into a tape recorder until it sounds good.
- Don't say too much about each slide. Don't spend time describing what your audience can obviously see in a slide.
- Get a second opinion. Ask someone who is familiar with the topic to review your content. Find someone you trust to offer creative suggestions on your writing.
- When typing your script, a good format is to type the narration down the right half of the page. The left half can then be used for notes on the slides and music. If you double space using this format, you can estimate that each page of script will represent one to two minutes in your show.
- For cue card shows, write down the key words of ideas or facts you'll need for each slide. It may be helpful to write down a few complete sentences -- especially for the beginning of a show, when you will be most nervous.

Section 5. Difficult Topics

Most Americans don't have your background and experience overseas. You will give them a new look at the far-reaching influence of the United States around the world.

- Exercise caution about common cliches and stereotypes. If your first slide of India is the Taj Mahal, or if you open your show on the South Pacific with hula dancing, you are falling into the "travelogue" syndrome.
- The living conditions to which you became accustomed may look "poor" to many Americans. Use care when talking about "poverty."
- Photographs can be deceptive when presented out of context.
- Don't compare things to the U.S. in a judgmental way.
- Don't try to simplify complex issues.
- Be understated. A show which lets the audience form their own conclusions is usually more effective than one which editorializes.

Section 6. Using Music

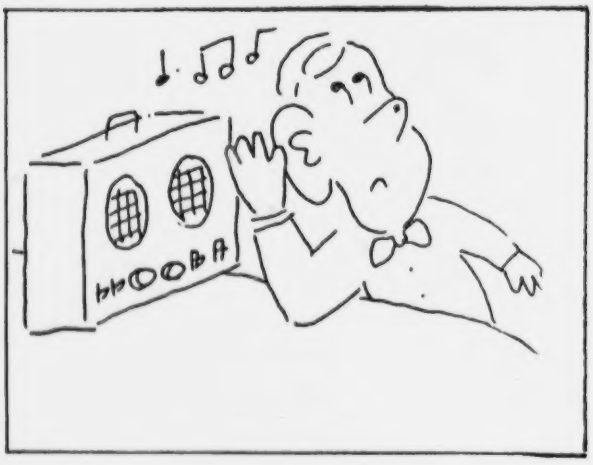
In a matter of seconds, even before your first slide appears on the screen, you can capture your audience's attention and set the mood of your show with music.

- Music can be used in a recorded soundtrack, as background music for a live narration of slides, or as an attention-getter before you begin your talk.
- Be true to your region. Tijuana Brass music in a show about South America isn't appropriate. If you deviate from the traditional music of the country or region, be aware that your audience might be distracted when the music they hear and the images they see seem to conflict.
- Opening and closing with the same piece of music often pulls a show together. This is a common and very effective technique.
- Let music change the pace of your show. Changing to upbeat music in the middle of a show can reflect a lighter topic, while slower, melancholy music helps establish a more serious mood.
- Use a variety of music. The same music running through the whole show tends to get monotonous.
- Instrumental music is usually a better choice than vocal selections unless you are using lyrics to make a point.
- You don't have to have music throughout the show. Sections of a soundtrack with just narration are fine.
- When you are using several pieces of background music for a live show, use a separate cassette tape for each selection. When you want the new piece of music to begin, just put the next tape in your recorder and press PLAY. If all of your music is recorded on one cassette you might have to fast-forward the tape to get to the next selection. Carefully label each tape indicating the music, the running time, and if your tape player has a counter, the place the music starts.

- The public library is a good place to start looking for ethnic music. If you find music you like and the records are in bad shape, you might have to buy a clean copy at a record store. Some record stores carry an extensive collection of music from around the world, but it tends to be expensive. Local markets run by people from the region you're interested are also a source of music.
- The next time you travel overseas, buy tapes or records of local music.
- You can record your own music as you travel, but it usually requires rather expensive tape recorders to get good results, although recording background sounds such as markets and festivals works quite well with simple equipment.

A Quick Note On Pirating and Copyrights

Music on records you borrow or buy is protected by copyrights and is not intended to be used commercially without special permission. This is usually only a concern if you are selling your show or presenting it to a paying audience.



Section 7. Recording a Simple Soundtrack

Using an ordinary cassette tape recorder, you can record a soundtrack with narration, music, and even "voice-over-music" to play back as you project your slides.

This simple soundtrack involves using a stereo tape recorder. One channel is used for the narration and the other is used for the music. When the soundtrack is played back with the two speakers close together, the result is a natural sounding audio mix.

Equipment

You will need a stereo tape recorder -- either a home cassette deck or a portable "boom box." If you want to blend music and narration, a second tape recorder or record player is needed. You will also need a plug-in microphone if your tape recorder doesn't come with one.

Tape recorders with built-in microphones. If the tape deck does not accept plug-in mikes, you will need to read the narration into one built-in mike and set the speaker from your second tape player next to the other mike. The quality of this kind of recording arrangement will not be as good as with more sophisticated equipment (described below), but it should sound fine.

Tape recorders which accept plug-in mikes. Most home cassette decks let you plug in microphones, as well as record directly from "line-level" sources such as another tape deck. This means the sound quality is much better than using the built-in mikes of a "boom box."

Don't spend a lot of money on a microphone unless you're really going to get serious about this. Radio Shack has a good selection of mikes in the $15 to $30 range that will be fine for recording narrations. I recommend a "cardioid" or uni-directional type microphone.

See Tech Note #1, Audio Levels You Should Know, for an explanation of the difference between "microphone," "line," and "speaker" audio levels. This is important to know when trying to record between two pieces of audio equipment.

Recording Procedure

With either type of tape recorder, the procedure for recording a soundtrack is the same:

- Before you begin, pick out your music and mark on the script where it is supposed to fade in and out.
- Experiment a bit before starting. First, read your script into one mike and adjust the input level. Play it back to see how it sounds.
- Then play your music into the other channel. With a boom-box, this means into the other built-in mike. With home cassette decks, this is through a connecting cable directly from another tape deck. Adjust the music level until it matches the volume of the voice.

See Tech Note #2, Recording Level, for an explanation of how to achieve a proper audio level when recording your soundtrack. This is very important since your recording level affects the overall quality of your soundtrack.

- If you can monitor your recording with headphones as you go along, when you lower your music for a voice-over, you will hear exactly how it sounds. If you cannot monitor the recording, experiment to determine how far to lower the music for a voice-over.
- Generally, it is best to fade music up and down, rather than just turning the tape recorder on or off. This fade-in and fade-out adds a professional touch to your show.
- The tricky part of using home tape recorders for making a soundtrack is recording the narration and the music at the same time. If you make a mistake, you need to go back and re-record both parts. With careful planning, you should have no trouble doing a good job.

- To start a show, fade your music level up. Just before your narration begins, lower the music volume about 2/3 of the way. During long pauses between narration segments, bring the music back up, or start a different selection of music.

- Look for places to stop every few minutes when recording your show. The best places are during sections of narration without background music or between selections of music. These pauses will allow you to go back and check your soundtrack before moving on.

See Tech Note #3, Buying Good Audio Tape, for information on selection cassette tapes for recording.

Section 8. Editing Slides

Editing slides is what makes a show. Even if you don't consider yourself a great photographer, you can end up with a dramatic slide show -- mediocre slides which have been carefully edited will form a more effective slide show than outstanding slides which have not been well edited.

- The first rule of editing is **be brutal**. Eliminate technically poor slides from the start -- they distract more than inform. If slides are fuzzy, too dark or too light to show details, or if the subject is only half in the picture, get rid of them.

- Just as your script should bring an audience into a show, so should your slides. When profiling a region or country, begin with wide shots that show the countryside, move in closer to scenes of towns and buildings, then to shots of people. This helps give the audience a sense of place. If your show is about a general topic such as hunger, health, or women, you can begin the same way with wide shots with people, then move in.

- Begin your show with your best slides, and end with strong images as well. These are the slides that the audience will remember.

- Consider running four or five slides at the beginning with no narration. This establishes location and mood.

- Build sequences of slides that tell a story.

- Show the ordinary, not just the spectacular. While colorful traditional clothing worn at festivals is very photogenic, using many photographs of it gives an unrealistic view of what the people usually look like.

- Audiences appreciate seeing how ordinary families live, especially when your narration adds a personal touch.

See Tech Note #4, Slide Mounts, for information on remounting your slides in cardboard or glass mounts.

Using A Slide Editing Table

Use a light table or a slide sorting tray when editing your slides. There are many kinds. Some are just a flat piece of frosted plastic with a light below, others have a sloping front with ridges to hold rows of slides. (The most common sizes hold either 40 or 80 slides.) With a light table, you can spread all your slides out in front of you and quickly sort through them.

It takes a while to get used to looking at the slides unmagnified on a light table, especially if you are used to editing with a projector and screen. With practice, you'll probably find it faster. Sharpness can be checked with a slide loupe (a magnifier which covers the field of a slide). Also, it is easy to compare exposure from slide to slide when you see them side by side.

Section 9. Putting a Show Together

This is the easy part. You now have your cue cards or script written, or your soundtrack recorded. If you are using background music for a live show, it has been recorded and labeled for use. You have sorted through your slides. Now you're ready to put the parts together.

- Use a pencil to draw lines after each paragraph or section to show where the slide changes should come. As a very general guideline, a slide change every 5 to 20 seconds is a good pace.
- Photocopy your script so when you finally decide on the slide changes, you can mark them on a clean copy.
- Number each slide change on the script (or cue card). This makes it easier to find a slide position on the light table (or in the slide tray later on). Do this in pencil since the number of slides will change as you refine the show.
- Look through your slides again. Categorize them in slide boxes or stacks, such as landscape shots, general people shots, agriculture, home life, and of course, "Cover Shots For NATIONAL GEOGRAPHIC" -- you'll need these for your strong beginning and ending.
- The location of some slides will be obvious. Position them first. Put them up on the light table, leaving blank spaces for the slides yet to come.
- As you read through the text of your show, take slides from the appropriate category and fill in the gaps.
- There will inevitably be parts of the script that don't suggest any appropriate slides. This is the challenge. Draw from your people shots, village shots, and landscape scenes to fill in these areas. Your slides and text don't have to match exactly. What is important is that the slides don't distract the audience from your message.
- Maps, photographs of artwork, or copies of historical photographs can be used to fill out the show. (See Section 13 for tips on making these slides.)

Section 10. Presentation Tips

The best slide show can be ruined by a poor presentation. The details of equipment, facilities, and logistical arrangements with the school or organization are just as important as creating your production.

Arrangements to Make Beforehand

- Confirm the time, place (including directions), and your contact person for that day.
- Have them specify exactly how much time you will have and what they expect you to present.
- Ask about the number of people that will be attending and their background.
- Find out what facilities are available. Is the room dark? Do they have a slide projector? To some people a slide projector is a slide projector. If the organization or school is supplying one for you, specify exactly what kind you need. Also, do they have a screen, projection stand, and extension cords?
- Tell them how much time you need to set up and take down your equipment.

Equipment You Should Bring

The less you rely on someone else supplying equipment, the less likely you are to be disappointed when you arrive. If you have the equipment yourself, bring it. The items most often forgotten include:

- Long extension cords (25 to 50 feet).
- Multi-prong AC adapters.
- Spare projection bulbs.

Tools to Carry

A few tools and accessories come in handy:

- A flashlight is a must. The little "Mini-Mag Lite" is just about indestructible and puts out a lot of light for its size.
- A small roll of 2-inch-wide duct tape or gaffer's tape. This is great for taping down cords so people don't trip over them, and for taping back together just about anything that breaks.
- A Swiss Army knife.
- A camel's hair blower brush for dusting off lenses and slides.

Setting Up a Room

This is simply a matter of making sure that everyone can see and hear. Set up your equipment, put a slide up on the screen, and walk around the room. You will quickly find out where people can sit and still see the screen well.

If you have a tape recorder for the music, do the same thing. Pre-set your volume. Keep in mind that the presence of an audience will absorb sound and you'll likely need to turn it up a little.

Before you are introduced, cue up your tape recorder to begin as soon as you push PLAY. Have your slide tray set to go. Find out where the light switch is.

Preparing an Audience

Even elementary school students can get a lot out of a rather complicated show if it is introduced correctly. Briefly preview what your presentation will cover. Before starting a show, some people have found it helpful to ask a few general questions about the topic or country to get the students thinking. This probably doesn't hurt with adults either.

Section 11. Common AV Equipment

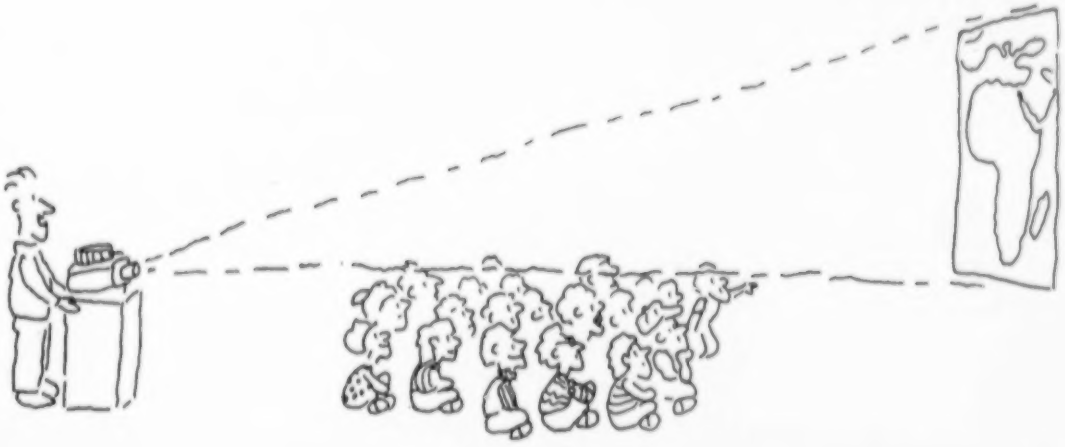
The variety of audiovisual equipment available is almost endless. Knowing the most common models is important when you buy or borrow equipment.

Slide Projectors

The word here is Kodak. There are cheaper and more expensive types of projectors available, but without a doubt, the industry standard is the Kodak Carousel and Ektagraphic line slide projectors. Kodak projectors are the most reliable you can buy. Unlike other types of projectors, slides are not forced into a Kodak projector, they simply drop, greatly reducing the possibility of a jammed slide.

Both the Ektagraphics and Carousels have just about the same features; the Ektagraphics are the professional versions, engineered for continuous use and brighter projection bulbs. For most people, the extra expense for the Ektagraphics can't be justified and the Carousel will serve nicely. Of the many features offered with these projectors, I think the most helpful is auto-focus. Remote focus, which lets you adjust the focus with a remote control, is sometimes helpful, but usually auto-focus works well by itself. I don't recommend spending extra money for timers and built-in screens.

Carousels begin at about $150 for the basic model, and go up to about $500 for the top-of-the-line Ektagraphic. Carousel "clones" such as the Caramate are also available in varying price ranges. I recommend you stick with Kodak.



Projection Lenses

If you can afford one, a zoom lens is a big advantage since it lets you fill the screen at a variety of distances. Kodak makes a 4" to 6" zoom which is a good choice. If you can't afford a zoom, a fixed focal length lens of 4" or 5" will be fine.

Kodak offers "Flat Field" and "Curved Field" lenses. Curved field lenses are optically engineered to compensate for the natural curve of the film in a slide mount. These work very well for the way most people project slides -- in the original cardboard mounts.

I prefer the flat field lenses. Although they don't compensate for the natural curve of the film, the slight distortion on the edges is barely noticeable. And, unlike curved field lenses, they also can be used with glass mounts (which flatten the emulsion), and slides that have been turned around backwards for artistic reasons.

Audioviewers

These are slide projectors with built-in screens and tape recorders. Various models can playback and record slide/tape shows and most can also be used to project the image on a wall. Audioviewers are somewhat expensive, but a good investment for those who make many presentations to small audiences. Kodak and Bell & Howell, as well as other manufacturers, make audioviewers that begin at about $300.

Kodak EC Sound-Slide Synchronizer

This small device is about the size of a cassette tape box. It works with a stereo tape recorder, and is used to record and playback automatic advance one-projector slide shows. It costs about $100. See Section 15 on one-projector programmed shows for details.

Screens

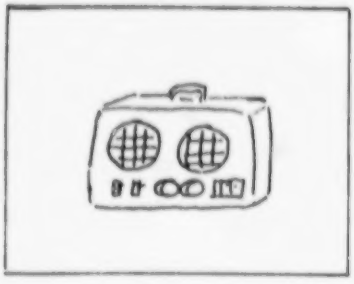
A five- or six-foot self-standing screen is a good choice for size (this measurement is the approximate width of the screen). Those smaller than this are not much use in classrooms, and those larger become too difficult to carry around.

There are several screen surfaces to choose from. "Matte" screens have little texture and appear equally as bright to people on the side of the audience as to those in the center. "Beaded" screens (with little glass beads that feel like sandpaper) are much brighter than matte screens, but are only useful in narrow rooms where no one is sitting too far to the side. A good compromise (and my recommendation for a five- or six-foot screen) is "lenticular." These are usually silver color and have a ribbed kind of texture. They are almost as bright as beaded screens but are still visible to people sitting off to the side. Unfortunately, lenticular screens are the most expensive kind. One brand name to look for is Da-Lite. Prices begin at about $60 and run up to about $150. Expensive screens tend to be more rugged, but don't show slides any better than cheaper ones.

Tape Recorders

There are three basic categories of cassette tape recorders found in AV:

Home cassette decks and "boom boxes" are useful for playing a soundtrack or background music for a live show. The sound quality of "boom boxes" can be quite good and usually can put out enough volume for a fairly large room. Audiovisual tape recorders use one channel to record the soundtrack, and the other to record the slide advance cues. The big advantage of AV decks is that they have "sync" ability -- you can record one track, then listen to it as you record the other -- which you cannot do with home cassette decks.



The most common brand of AV deck is the 3M/Wollensak, and most models have built-in features for recording and playing back slide advance cues for one projector slide/tape shows. Sharp and Audiotronics also feature lines of inexpensive AV decks with cue pulsing features. Prices range from about $150 to $500.

Multi-track cassette decks feature four channels that can be independently recorded. The audio quality is usually outstanding and their versatility makes them good choices for more advanced soundtrack production. Brands to research include TASCAM (the TEAC production line), YAMAHA, and FOSTEX. Small portable units start at about $550 and go up to well over $1,000.

See Tech Note #5, Cassette Tape Recorder Formats, for details on compatibility between different types of tape recorders used in audiovisual work.

Reel-to-reel tape recorders usually have very high audio quality. If you have a reel-to-reel use it, but the advanced multi-track cassette machines are a much better value if you need to buy a tape deck.

Buying Used Equipment

Look for AV equipment at auctions, garage sales, and flea markets. You should have little trouble finding a used screen for $20 or $25. Slide projectors and tape recorders are bigger risks, but with some intelligent shopping you can come up with some good deals. Go to dealers and look at their new equipment. Get to know the models you're interested in and then check the classifieds.

Section 12. When Your Equipment Dies...

Many variations of "Murphy's Law" apply to the audiovisual field. The more important the show, the bigger the audience and the farther away from home you are, the more likely you'll find a gremlin crawling into your equipment to mess something up.

The best cure is prevention. Use good equipment. The extra dollars you spend will save you agony in the long run. Sooner or later even the best equipment will die. Here are the most common disasters:

Projection Bulb Burns Out

This needn't be a disaster, but often it is. Carry an extra bulb. Those who don't are fools. Even if you just put a new bulb in your projector, you still need to carry a spare since new ones occasionally blow very quickly.

Bulbs usually blow when the equipment is first turned on, and so they aren't very hot yet. Should one blow in the middle of a show, be aware that they can be very hot. Use a piece of cloth to pull them out. When putting in the new one, be careful not to touch the glass reflector or central element of the bulb with your fingers. Again, use a cloth.

Cassette Tape Jams

This is usually preventable. Buy only high quality cassettes and never use C-120 tapes. Before you put the cassette in the deck, make sure the tape is snugly wound on the reels by inserting a finger tip into the sprockets of both reels and gently turning them opposite directions.

If your tape deck does begin to eat tape or jams up, stop it immediately. Slowly and gently try to pull the cassette out. Usually you can get it out without breaking the tape. Use a pencil or your finger to wind the cassette well past the bad section (which will be wrinkled), and try again. A stretched or wrinkled section of tape will often jam when you try to use it again.

Slide Jams

This too can usually be prevented. Use a good projector, such as a Kodak Carousel or Ektagraphic, and do not use 140 capacity slide trays -- sooner or later slides will fail to drop into the slide gate. Periodically check the condition of your slide mounts. After a while, cardboard slide mounts will get bent and will not drop easily. (See Tech Note #4, Slide Mounts, for information on remounting slides).

With Kodak projectors, often a slide simply hasn't dropped and is still up in the slide tray. Press the SELECT button and the slide may drop. If it doesn't:

1. Remove the slide tray by inserting a screwdriver into the center of the one-inch-wide slot in the middle of the tray and turn the slot -- this releases a small retaining bar which holds the tray in place.

2. Carefully lift off the slide tray. Note: the bottom metal plate of the slide tray is no longer in the zero position and slides can drop out the bottom. A plastic or metal release lever in the center of 80-slide trays will let you twist the bottom metal plate back to the zero position. Be sure to secure the top retaining ring of the tray before turning it upside down to do this!

3. Now, reach down and pull out the jammed slide. Before putting the tray back on, cycle the projector a few times by pressing the "forward" button.

If a Kodak projector jams or fails to advance, the slide tray is usually at fault. Periodically check the condition of the plastic pins on around the bottom of the tray. If any are damaged, replace the tray.

With non-Kodak projectors, things usually aren't quite so easy. The slide may have been forced into the projector and bent.

1. Turn off the projector and try to gently pull out the metal arm which pushes slides into the gate.

2. If possible, remove the slide tray and use your fingers or tweezers to pull out the slide.

3. Sell the projector and buy a Kodak.

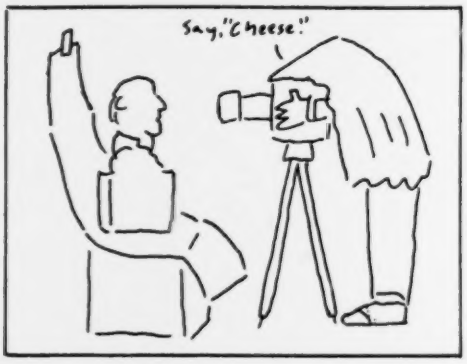
Section 13. Getting Slides from Non-Slides

A good way to add visual variety to your show is to make slides from your negatives, prints, artwork, maps, and artifacts. This is also a good way to get visuals when you don't have any appropriate slides for a topic in your show.

- Slides can be made from color negatives. Take them down to a camera store and they can send them to Kodak. They cost less than a dollar each, and the quality is very good.
- Slides can also be made from either color or black & white prints. Custom photo labs can do this for you but it is likely to be quite expensive (probably several dollars a piece). If you have a high quality camera with a close focusing lens you can do this yourself.

See Tech Note #6, Copying Photographs & Artwork, for suggestions on doing copy work at home.

- Dark, underexposed slides can often be salvaged by custom duplicating. Overexposed slides usually cannot be saved.
- Maps and paintings make nice additions to a slide show.
- Artifacts are easy to photograph. Isolate the object on a "seamless" background such as a solid color sheet or blanket. Drape the material over a chair and put your artifact on the seat of the chair. Move in close with your camera so that your background fills the frame, leaving your artifact prominently displayed.



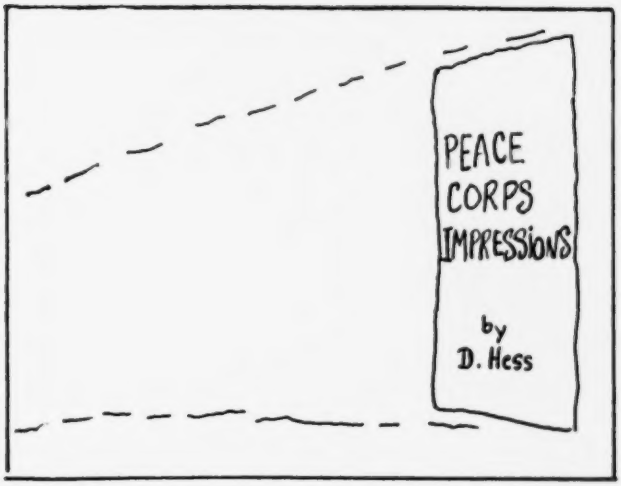
Section 14. Making Title Slides

Titles and credit slides add a nice finishing touch to a show. There are many ways to get them:

- You can photograph names and titles from books and maps, or draw your own titles. (Use the copying techniques outlined in Tech Note #6 on copying artwork.)
- Look for signs in your travels, such as the names of cities or countries; slides of them are useful as titles.
- For the most professional-looking results, make "reverse text" slides. These are bright colored letters against a black or colored background.

See Tech Note #7, Making Reverse-Text Title Slides and Maps, for this technique.

- Computer graphics are becoming a popular way of getting title slides. You might be able to do this yourself, if not, there are many companies that can do them quickly for you. They will cost several dollars a piece.



Section 15. One-Projector Programmed Shows

These shows are easy to produce on audiovisual tape recorders or with the Kodak EC Sound-Slide Synchronizer. Once they have been recorded, they can be played back automatically.

Using An Audiovisual Tape Recorder

With these decks, simply plug in the projector to the tape recorder, and as you listen to your soundtrack, push the SLIDE ADVANCE button when you want to change slides. These changes will be recorded and can be played back later.

Your soundtrack can be recorded on both the right and left channels of a home stereo cassette deck, or on the "audio" channel of the AV deck.

Check the owner's manual for specific instructions on how to record the cues on your equipment.

Using The Kodak Sound-Slide Synchronizer

A home cassette deck can be used for this. It is easiest to use two tape decks or a dubbing deck. Record your soundtrack on one deck, then record the soundtrack directly into the left channel of the second deck. At the same time, record the pulses with the Sound-Slide Synchronizer into the right channel. Keep the audio level of the cue track fairly low and you will be less likely hear the cue pulses bleeding through to the audio track.

When you play back the show, send the output from the left channel to your amplifier for the soundtrack, and the output of the right channel to the Sound-Slide Synchronizer.

Section 16. Photography Suggestions

Next time you're traveling, think about slide shows as you take photographs.

- Take a mix of landscapes, city shots, and people pictures.
- Photograph the details of places and things. These shots add interest and variety to your show.
- Failing to move in close enough is probably the single most common mistake in composition.
- Photographs of people are important to any slide show. Take advantage of the friends you make overseas and photograph them and their families.
- Strangers are harder to photograph. If you have a telephoto lens you can take photographs less obtrusively. A wide angle lens is good also, since you can move in close and include people in scenes. People pictures don't have to be tight head shots. Include the environment, and what they are doing, in the photograph.
- Be sensitive. This should go without saying, but many tourists go around shooting with no regard for their subject's privacy. If in doubt, ask permission. A smile usually goes a long way.
- Limit the camera equipment you carry. Avoid hanging two or three cameras with long zoom lenses and motordrives around your neck. The less obvious (and obnoxious) you are, the more likely you can move in and get better photographs.

Section 17. Books for Further Reference

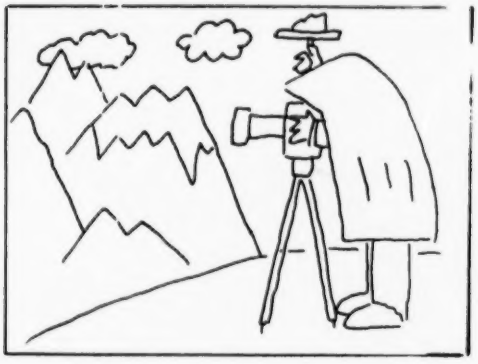
The following books are published by Kodak and are available at most large camera stores.

1. *SLIDES: Planning and Producing Slide Programs.*
   This is the best book I have seen on producing one- and two-projector slide shows. It is aimed at businesses but the information is still relevant for educational slide shows as well. It offers detailed information on planning and producing shows, making graphics, and programming your show.

2. *Presenting Yourself.*
   This book is also geared toward businesses, but has good information on using slides in conjunction with public speaking.

3. *The Source Book: Kodak Ektagraphic Slide Projectors.*
   This book has everything you could ever need to know about Kodak slide projectors -- along with lots of things you would never need to know.

4. *Kodak Master Photoguide.*
   This small pocket handbook of photography techniques is worth carrying on your travels. It offers information on everything from shooting at night to copying artwork.



Section 18. Tech Notes

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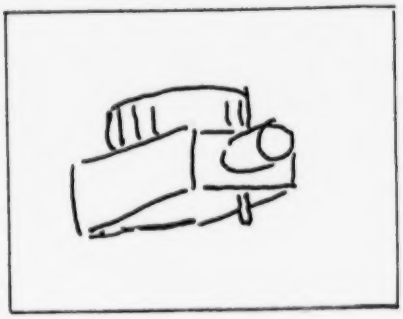


Tech Note #1

Audio Levels You Should Know

An audio level can be thought of (somewhat inaccurately) as power or volume. Sometimes a signal going into or out of a tape deck or amplifier will be very strong, and sometimes it will be very weak. There are several basic audio levels you will encounter.

- Speaker Level comes out of an amplifier and feeds the speakers. This is very high power. The level going to headphones is also high power.
- Line Level is the common level that goes back and forth between tape decks and amplifiers. This can be thought of as a "medium" power level. Line level is usually used when copying from one tape deck to another.
- Microphone Level (or Mike Level) comes out of microphones and goes into tape decks. This is very low power. Within this low power range, microphones can vary quite a bit in how much signal they put out.

What is most important to understand about the three audio levels is that each has a specific purpose. You should not connect your audio equipment together without paying attention to audio level. For example, if you plug the high-level speaker output of an amplifier into the low-level microphone input of a tape deck, you will very likely damage your tape deck.

What makes the situation more complex is that the same type of connector or plug might be found used on different equipment for all three levels. As a basic guideline read what your equipment says next to the plugs. Speakers and mikes are usually clearly labeled. Line-level inputs and outputs may say "Line IN/OUT" or "Left In/Right In and Left Out/Right Out. Consult your owner's manual when in doubt.

Tech Note #2

Recording Level

How loud you record on your tape is very important. If your recording level is too low, you pick up lots of tape noise and it takes a lot of power to play it back at sufficient volume. If you record too high, the sound will be very distorted. Recording at a proper level is not difficult.

- Tape decks with dials and needles calibrated in "VU" (volume units) and "dB" (decibels): Zero VU is considered the nominal level, but since music and voice range greatly in volume (from silence to loud peaks), it takes some practice to judge where the bouncing needle should be. Generally, you want the peaks of volume to put the needle into the red zone. In other words, if you are recording with the needle below 0 VU all the time, your level is too low; if you are recording with the needle always above 0 VU, then your level is too high.

- For decks with LED readouts the same rule applies, you should be peaking into the red zone, but not up there continually. LED's are generally faster reacting and more accurate than needles.

- Some decks have both needles and a "peak" LED. With these decks, you can bring up the level until the peak indicator is occasionally lighting up.

In general, when recording music from a record or commercial tape, turning the recording level knob (or slider) of your tape deck to "7" on the scale of 0 to 10 yields the nominal level (the needle or LEDs should be peaking into the red on the VU readout).

Tech Note #3

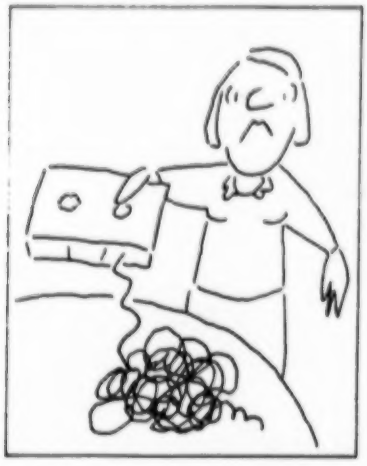
Buying Good Audio Tape

There are two considerations. The first is sound quality, initially as well as after being played dozens of times. The other is the mechanical quality of the cassette mechanism. Since it must withstand lots of use, skimping here may leave you with a jammed cassette.

There are three common grades of tape to choose from: Normal (type I), High Bias (type II/CrO2), and Metal. Each has advantages and disadvantages. Normal is the most common and least expensive. High Bias yields better audio quality with good tape decks. Metal is only an advantage with very high-quality tape decks and sound systems.

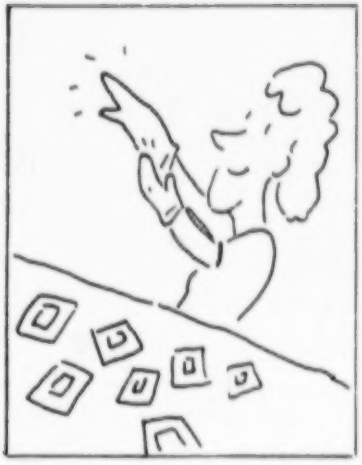
My personal recommendation is to use Normal Bias tape when using boom boxes or inexpensive home cassette decks, and High Bias when using higher quality home decks. Don't waste your money on metal tape for the applications we're concerned about.

I strongly recommend that you buy expensive tape. For Normal Bias you might try TDK AD-X or Maxell UD-XLI. For High Bias, try TDK SA-X or Maxell UD-XLII. Use only C-60 (30 minutes per side) or C-90 (45 minutes per side). Do not use C-120 (1 hour per side) since this tape will eventually stretch or break.



Tech Note #4

Slide Mounts



Processed slides usually come back in open-frame cardboard mounts. These are fine for most purposes. After a while, the edges may get worn, causing the slides to be slow and to drop into the projector. You may want to remount old slides before trouble begins. You might also need to mount slides when getting title slides or graphics back from a photo lab.

- Kodak makes cardboard "Ready Mounts" which you can seal with a hot iron. Ready Mounts are inexpensive and easy to use for small quantities of slides.

- For shows that will be presented often, I recommend re-mounting your slides in open-frame plastic mounts, such as the ones made by Pakon. They don't warp and the image has sharp edges (rather than the soft edges of cardboard mounts).

- Glass mounts are thick plastic with glass on both sides of the film. They keep the film perfectly flat so the image is sharper and you don't have to use auto-focus. Schools and businesses often use glass mounts since the film is protected from fingerprints.

  Glass mounts, however, are expensive and heavy. In hot, humid climates, sometimes fungus begins to grow on the film below the glass. For most purposes, glass mounts aren't necessary.

- I recommend buying a pair of white cotton gloves, available at camera stores, to wear when handling your slides for remounting.

- To cut open a slide in a cardboard mount, use a sharp single-edge razor blade and cut across the slide at the bottom of the word "Kodachrome" or "Ektachrome." Then carefully bend the top edge back and the piece of film will be free. Practice on a few rejects before taking on your good slides.

Tech Note #5

Cassette Tape Recorder Formats

There are several different types of cassette tape decks used in the audiovisual field. The cassette itself has been standardized, but the way a tape deck records on the cassette can vary.

If you only intend to use home cassette decks or boom boxes, this information isn't important, but should you want to use more specialized tape decks you may encounter some problems. For example, a tape recorded on a home cassette deck may not sound right when played on a multi-track cassette deck, or it might even start wildly advancing your slide projector if used on an AV cassette deck.

A few definitions:

- **Channel:** an audio band which can be played back or recorded. For example, home stereo decks have two channels (usually called right & left) that can be played back and recorded. Inexpensive mono decks have one channel. Some multi-track cassette decks have four channels.

- **"Sides" of a cassette tape:** contrary to what most people think, cassettes are not actually recorded on two different sides of the tape. Pick up a cassette and look at the exposed tape. A home cassette deck records side "A" on the bottom half of the tape. Flip the cassette over and you'll see that side "B" is just the other half of the tape.

  Home cassette decks and inexpensive mono tape recorders use two "sides" of the cassette by recording on one half of the tape, the flipping them over and recording the other half. Some cassette decks record across the entire width of the tape in one pass and can be thought of as having just one side.

- **Track:** the actual division of audio bands on the tape. A home cassette deck has four tracks -- so it can play stereo on two sides. Mono decks have two tracks -- one for each side. And four channel decks have four tracks to be played or recorded on one side.

- **Track Width:** the proportion of the tape width used for each track. The home cassette deck is often called a "quarter-track" since each of the four tracks takes up about 1/4 the width of the tape. Four-channel tape decks are also "quarter-track," where each of the four tracks takes up about 1/4 of the tape width. Simple mono decks and audiovisual tape decks are called "half-track" since each of the tracks takes up about half the width of the tape.

- **Cross-talk:** Even though there is a small amount of space between each track band on a tape, what is recorded on one track can sometimes "bleed through" and be heard on the adjacent track. This is called cross-talk.

  The space between the pair of quarter-tracks in a home stereo deck is narrower than between the half-track bands. Therefore, there is more cross-talk on a quarter-track, 2-channel stereo home cassette deck than on an AV half-track deck. This really doesn't make any difference with a home stereo since both channels are listened to at the same time. But when you have recorded a cue track (that you don't want an audience to hear) next to an audio track, cross talk can become a problem.

- **Symul-sync:** On home cassette decks you must record both the right and left channels at the same time. On decks with symul-sync, you can first record one channel, then listen as you play it back and record another channel. This is a great advantage in audiovisual work when you might first want to finish your soundtrack, then be able to go back and record a cue track at a later time.

Common Cassette Deck Configurations

Single Channel Mono: Small, inexpensive portable cassette decks use this half-track, 1-channel format. You record mono on two sides.

Home Stereo Decks. These are quarter-track, 2-channel stereo. You can record stereo on two sides.

Audiovisual Tape Recorders: This half-track, 2-channel format records stereo on just one side, but there is very little cross-talk between channels. They also usually come with symul-sync.

Multi-track Cassette Decks: These are usually a quarter- track, 4-channel format with symul-sync, recording on only one side. This allows you to record four separate channels while listening to any combination of channels. Some of them run at twice the normal cassette speed to improve audio quality, and they often have sophisticated noise reduction capabilities. These decks are expensive and worth the investment if you are serious about AV work.

What Can Play What

When a tape recorded on one type of machine is played back on another type, this is what to expect:

Single Channel Mono decks can play a tape from a home stereo deck (but not in stereo), and the left channel recorded on an AV deck.

Home Stereo Decks can play tapes from a single-channel mono deck (but not in stereo), and the left channel from an AV deck (but not in stereo).

AV Decks can play a tape from a home stereo deck on the left channel of the AV deck (but not in stereo). If you listen to the right channel, you will hear the flip side of the home deck tape playing backwards.

Multi-track Decks -- depends on the tape speed, noise reduction and track configuration -- consult the owner's manual.

Tech Note #6

Copying Photographs and Artwork

Using fairly simple equipment you can get high-quality slides from color or black and white prints, maps, and paintings.

- You will need a 35mm single lens reflex camera with close focusing lens. A macro lens is ideal, but high quality results can also be achieved with most any normal 50mm lens.

- If your lens doesn't focus close enough, you can buy screw in close-up lenses at a camera store. Close-up lenses are usually measured in diopters. With a 50mm camera lens, to copy something that is 8 x 10 inches, use a 2+ diopter close-up lens. For 5 x 7, it's a 3+ diopter, and for a small 3 x 5 inch print, it would be a 2+ plus a 3+ diopter lens.

- An extension tube between the lens and camera body also works very well but is more expensive than a close-up lens. Any time you use close-up lenses or extension tubes with a non-macro lens, stop down the lens to at least f/5.6 or f/8 for the sharpest results.

- A tripod is necessary to maintain sharpness.

- A Gray Card is used to determine exposure. The light meter in your camera has difficulty determining proper exposure for something very light or very dark. For example, if you photograph a white wall, your camera's meter assumes it is seeing something of average reflectance in very bright light, and so it will try to underexpose your photograph. The same problem can happen when photographing maps and artwork since they often have large areas of white or dark which throw off the meter.

  The answer is simple -- buy an 18% gray card from your photo dealer. Put the gray card in front of your artwork when you measure exposure (with camera on manual). The gray card will fool the meter and give an accurate reading for the light.

- Set up your artwork and camera outside and use sunlight for your exposure. Masking tape the artwork to the sunny side of your house to photograph it. Use a gray card to determine your exposure.

- Since the color of outdoor light varies a lot throughout the day, for the best results you should photograph your artwork indoors using a pair photoflood bulbs. They have uniform color qualities and the slides will have much more accurate color.

- I recommend using 3200-degree photofloods (250 watt is usually bright enough) and Kodachrome 64 or Ektachrome 100 film with an 80A color correction filter over the lens. You can also use Kodak's 50 ASA Tungsten Professional film without the filter for slightly better results.

Put one light on each slide of the camera, shining in at about 45 degrees. This will usually give even lighting. Use a gray card to determine exposure and you will get very good results.

Tech Note #7

Making Reverse-Text Title Slides and Maps

In black ink on white paper type or draw your titles or maps. The next step is to use a high contrast film to get a negative of this -- which will be white letters on a dark background. (When photographing the title slides, use a gray card, follow the suggestions in Tech Note #6.)

Quick Way With Vericolor SO-279 Film

This is a simple technique that will give you white letters on a variety of dark colored backgrounds. SO-279 is a professional film designed to use with 3200 degree photoflood bulbs. It can be processed at 1-hour photo labs.

1. Set your exposure meter for 8 ASA and use a gray card. If you camera exposure meter doesn't go down to 8 ASA, then set your meter for 32 ASA, take your meter reading, then open up by the equivalent of 2 f/ stops (for example, if at 32 ASA your exposure is 1 second at f/8, change your exposure to 4 seconds at f/8 or 1 second at f/4).

2. Bracket (vary) your exposure several f/ stops each way. Keep your exposures between one and eight seconds.

3. To change colors, use filters:

Filter	Color of background and letters
Orange	Blue with white letters
Yellow	Purple with light purple letters
Blue	Red with yellow letters
None	Dark red with yellow letters

4. Have the photo lab process the film and return it without printing. You will then need to cut and mount the slides yourself (see Tech Note #4 on slide mounts).

Using Kodalith or Technical Pan Film

This will yield white letters on a completely black background.

- For Technical Pan, set your meter for 200 ASA and develop in Dektol paper developer, 1:2 dilution, for 4 1/2 minutes at 68 degrees. Bracket your exposures. Tech Pan is available in 36-exposure rolls.
- For Kodalith, set your meter for 6 ASA (or for 25 ASA and compensate as #1 above). Develop in Kodalith Developer. Kodalith is available in 36-exposure rolls and 100 foot rolls.
- You can process the film yourself or take it to a custom lab. You may need to cut and mount the film yourself.
- You can add color by sandwiching a colored gel along with the film in the slide mount or by using felt pens on the slide. There are special watercolor paints available for this.